Application of the *in-vivo*-haploid induction in hybrid maize breeding

APPENDIX 1

Present Research Projects in the Department of ...

1. Reproductive and genetic investigations on *in-vivo*-haploid induction in maize (*Zea mays* L.)

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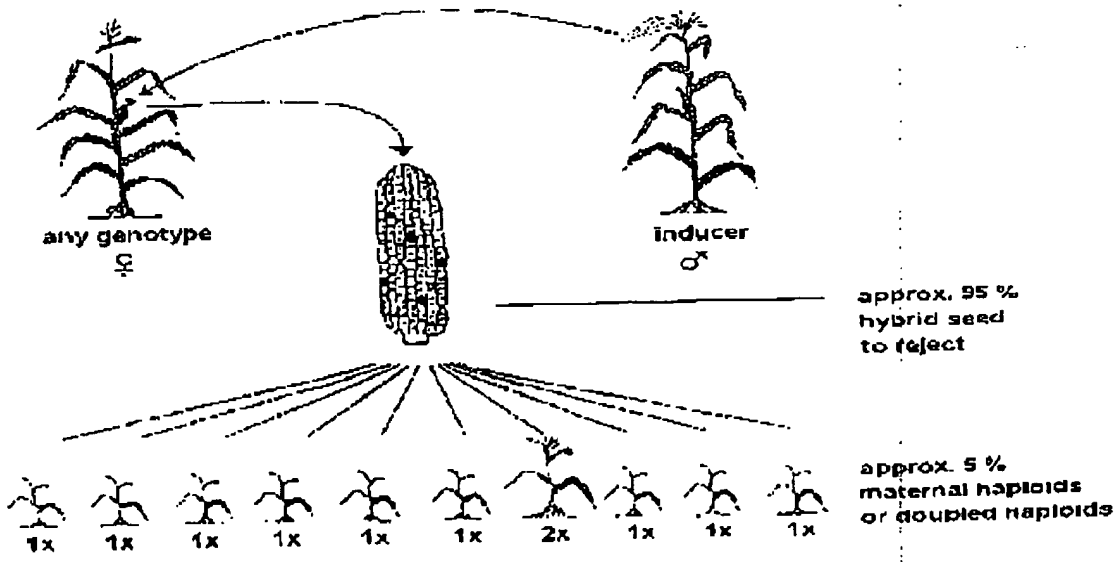
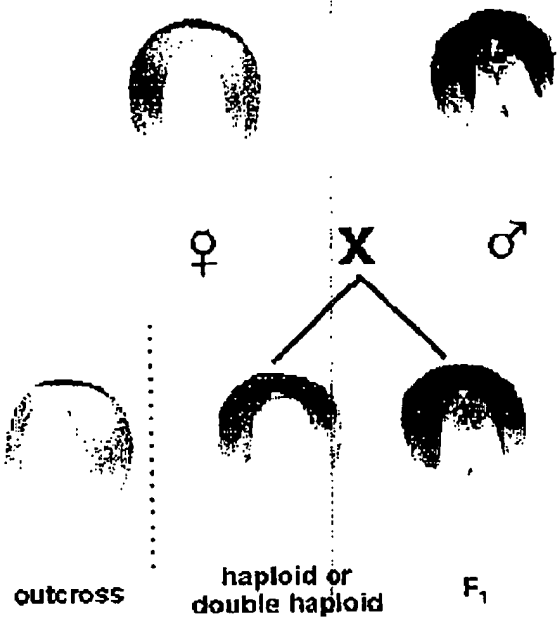
DH-Line in generation D_1

The interest in haploid/double haploid (H/D techniques has enormously increased in the l years. The introduction of H/DH-techniques i maize breeding programs traces back to the 5 Shortly after the first reports of the spontane occurrence of H/DH-plants in maize, scientists breeders started to discuss the application of s homozygous plants in breeding programs and t commercial use. By means of the developmen inductors and a method for artificial doubling of chromosome set, the H/DH-thechnique has b developed in the past years until such an extent it is beeing used as a matter of routine by m breeders.



After pollination with an inducer plant, kernels with H-embryo of maternal origin with triploid endosperm arise, together with regularly

double fertilized kernels. Chromosome elimination and parthenogenesis are considered to be the possible biological mechanisms responsible for the occurrence of H-plants. However, chromosome elimination and parthenogenesis exclude each other per definition. Therefore, we chose the neutral term ***in-vivo*-haploid induction** for the phenomenon menitoned.



Inductor RWS

The aim of our work was to develop a novel indu line with an increased induction rate. The r **inducer line RWS** developed, displayes both advantage of a high induction rate and combination of two dominant identification marke a red stem, and an embryo and endospe coloration. Inducer RWS enables the breeder to *in-vivo*-haploid induction as an effective tool for development of H/DH-plants with almost genetic background. The method is less effec with donor genotypes, carrying the ab mentioned identification markers or anthozya inhibitor-genes themselves.

The spontaneous doubling rate in maize ran from 1-10 %. Therefore an artificial chromosor doubling method to increase the number of fe DH-plants is essential. The artificial chromosor doubling method, using colchicine as doubl agent, facilitates an effective development of lines.

Identification of H/DH-plants based on lacking stem-coloration

H/DH-field